

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Commissioner
 US Department of Commerce
 United States Patent and Trademark
 Office, PCT
 2011 South Clark Place Room
 CP2/5C24
 Arlington, VA 22202
 ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 02 March 2001 (02.03.01)	
International application No. PCT/GB00/02595	Applicant's or agent's file reference P/5654
International filing date (day/month/year) 05 July 2000 (05.07.00)	Priority date (day/month/year) 08 July 1999 (08.07.99)
Applicant GALLICHAN, Kevin et al	

1. The designated Office is hereby notified of its election made:



in the demand filed with the International Preliminary Examining Authority on:

11 January 2001 (11.01.01)



in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was

was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO
 34, chemin des Colombettes
 1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

Authorized officer

Olivia TEFY

Telephone No.: (41-22) 338.83.38

PATENT COOPERATION TREATY

from the INTERNATIONAL SEARCHING AUTHORITY

PCT

To:
MESSULAM, Alec, Moses
43-35 High Road
Bushey Heath
Bushey, Herts WD23 1EE
UNITED KINGDOM

NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL SEARCH REPORT
OR THE DECLARATION

(PCT Rule 44.1)

Date of mailing
(day/month/year) 11/10/2000

Applicant's or agent's file reference

P/5654

FOR FURTHER ACTION See paragraphs 1 and 4 below

International application No.

PCT/GB 00/ 02595

International filing date

(day/month/year) 05/07/2000

Applicant

FORD MOTOR COMPANY LIMITED

1. ☒ The applicant is hereby notified that the International Search Report has been established and is transmitted herewith.

Filing of amendments and statement under Article 19:

The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 46):

When? The time limit for filing such amendments is normally 2 months from the date of transmittal of the International Search Report; however, for more details, see the notes on the accompanying sheet.

Where? Directly to the International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland
Facsimile No.: (41-22) 740.14.35

For more detailed instructions, see the notes on the accompanying sheet.

2. ☐ The applicant is hereby notified that no International Search Report will be established and that the declaration under Article 17(2)(a) to that effect is transmitted herewith.

3. ☐ With regard to the protest against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Further action(s):** The applicant is reminded of the following:

Shortly after **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90bis.1 and 90bis.3, respectively, before the completion of the technical preparations for international publication.

Within **19 months** from the priority date, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later).

Within **20 months** from the priority date, the applicant must perform the prescribed acts for entry into the national phase before all designated Offices which have not been elected in the demand or in a later election within 19 months from the priority date or could not be elected because they are not bound by Chapter II.

Name and mailing address of the International Searching Authority



European Patent Office, P.B. 5818 Patentlaan 2
NL-2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Cornelia Schulze

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference P/5654	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/GB 00/ 02595	International filing date (day/month/year) 05/07/2000	(Earliest) Priority Date (day/month/year) 08/07/1999
Applicant FORD MOTOR COMPANY LIMITED		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.



It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.



the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :



contained in the international application in written form.



filed together with the international application in computer readable form.



furnished subsequently to this Authority in written form.



furnished subsequently to this Authority in computer readable form.



the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.



the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the title,

the text is approved as submitted by the applicant.



the text has been established by this Authority to read as follows:

5. With regard to the abstract,

the text is approved as submitted by the applicant.



the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.



as suggested by the applicant.



because the applicant failed to suggest a figure.



because this figure better characterizes the invention.

4

None of the figures.

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G11B7/09

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G11B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	PATENT ABSTRACTS OF JAPAN vol. 1999, no. 08, 30 June 1999 (1999-06-30) & JP 11 066574 A (NIPPON CONLUX CO LTD), 9 March 1999 (1999-03-09) abstract	1
A	EP 0 550 097 A (PHILIPS NV) 7 July 1993 (1993-07-07) abstract column 3, line 1 - line 18	1
A	US 5 020 045 A (SMART GERALD J ET AL) 28 May 1991 (1991-05-28) abstract	1
	--- -/--	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

2 October 2000

Date of mailing of the international search report

11/10/2000

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Quaranta, L

INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 00/02595

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	PATENT ABSTRACTS OF JAPAN vol. 017, no. 605 (P-1639), 8 November 1993 (1993-11-08) & JP 05 182273 A (RICOH CO LTD), 23 July 1993 (1993-07-23) abstract ---	1
A	US 5 590 006 A (SHAFE MATHEW K) 31 December 1996 (1996-12-31) abstract ---	1,2
A	EP 0 558 293 A (CANON KK) 1 September 1993 (1993-09-01) column 5, line 19 -column 7, line 17 ---	1
A	PATENT ABSTRACTS OF JAPAN vol. 1995, no. 08, 29 September 1995 (1995-09-29) & JP 07 129983 A (SHARP CORP), 19 May 1995 (1995-05-19) abstract -----	1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 00/02595

Patent document cited in search report		Publication date	Patent fam member(s)	Publication date
JP 11066574	A	09-03-1999	NONE	
EP 0550097	A	07-07-1993	NL 9102190 A JP 5282676 A US 5289440 A	16-07-1993 29-10-1993 22-02-1994
US 5020045	A	28-05-1991	NONE	
JP 05182273	A	23-07-1993	NONE	
US 5590006	A	31-12-1996	CA 2164885 A EP 0799479 A WO 9620475 A HU 77155 A,B JP 2986392 B JP 8255320 A KR 221373 B PL 320689 A US 5701219 A	24-06-1996 08-10-1997 04-07-1996 02-03-1998 06-12-1999 01-10-1996 15-09-1999 27-10-1997 23-12-1997
EP 0558293	A	01-09-1993	JP 5234092 A DE 69321982 D DE 69321982 T US 5475660 A	10-09-1993 17-12-1998 12-05-1999 12-12-1995
JP 07129983	A	19-05-1995	JP 3035136 B	17-04-2000

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

MESSULAM, Alec, Moses
43-35 High Road
Bushey Heath
Bushey, Herts WD23 1EE
GRANDE BRETAGNE

PCT
NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL PRELIMINARY
EXAMINATION REPORT

(PCT Rule 71.1)

Date of mailing
(day/month/year) 11.07.2001

Applicant's or agent's file reference
P/5654

IMPORTANT NOTIFICATION

International application No.
PCT/GB00/02595

International filing date (day/month/year)
05/07/2000

Priority date (day/month/year)
08/07/1999

Applicant
FORD MOTOR COMPANY LIMITED et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/

 European Patent Office
D-80298 Munich
Tel. +49 89 2399 - 0 Tx: 523656 epmu d
Fax: +49 89 2399 - 4465

Authorized officer

Slater, S

Tel. +49 89 2399-2565



PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference P/5654	FOR FURTHER ACTION		See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/GB00/02595	International filing date (day/month/year) 05/07/2000	Priority date (day/month/year) 08/07/1999	
International Patent Classification (IPC) or national classification and IPC G11B7/09			
Applicant FORD MOTOR COMPANY LIMITED et al.			

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.


2. This REPORT consists of a total of 5 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 2 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 11/01/2001	Date of completion of this report 11.07.2001
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Lehnberg, C Telephone No. +49 89 2399 2590



**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/GB00/02595

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, pages:

1-9,12,13 as originally filed

10,11 as received on 18/06/2001 with letter of 05/06/2001

Claims, No.:

1-12 as originally filed

Drawings, sheets:

1/2,2/2 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/GB00/02595

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-12
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-12
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-12
	No:	Claims	

- 2. Citations and explanations
see separate sheet**

CONCERNING POINT V:

- 1). Reference is made to the following document:

D1: JP-A-11 066 574

- 2). The present invention relates to an optical media system according to the subject matter of independent claim 1 comprising a pickup for reading and writing from / to an optical medium, an objective lens, a focus and / or tracking actuator, mechanical limits to limit the focus / tracking movement of the lens, and an actuator controller for controlling the actuator and hence the position of the objective lens, the system being characterized in that the actuator controller actively controls the lens position when the optical pickup is not being used with the optical medium.
- 3). The system of the invention is essentially to be used in motor vehicles, and all source of noise is to be avoided. In very quiet cars, rattles were noted in a CD player when the car was driven on a bumpy surface. The source of the noise was traced to the CD pickup hitting the focus (or tracking) end stops when the pickup was in a parked position, owing to vertical vehicle movement and vibrations. The solution of the invention is therefore to actively control the lens position when the pickup is not being used with the optical medium, that is when the pickup is at the park position, and even when no medium is loaded in the device.

D1 cited in the International Search Report discloses a focus and tracking control of the objective lens during a standby when recording and reproducing is not carried out, this control being made on the basis of light beams illuminated from the optical head onto the recording medium. In this document, the light is still radiated onto the recording medium, and the problem to be solved is a problem of heat generation during said standby period. There, the solution is to light the laser source via an intermittently applied voltage to reduce heat propagation; nevertheless, the medium is still used to control focus and tracking.

Therefore, the content of D1 does not disclose nor suggest the subject matter of independent claim 1 as well as that of dependent claims 2 to 12.

Even the other available prior art documents do not disclose nor suggest the subject matter of the present set of claims.

Consequently, the present claims 1 to 12 are considered to meet the novelty and inventive step requirements of Articles 33(2)(3) PCT.

Even if no prior art document is cited in the present application documents, independent claim 1 is delimited in view of a well known optical media system having the basic components.

tracking servo circuit 72. The focus servo circuit generates an appropriate focus correction signal 73, and the tracking servo circuit 72 generates both a coarse tracking correction signal 74 that is fed to the tracking motor 45, and a fine tracking correction signal 75. The focus and tracking correction signals 73,75 are then fed back to the focus and tracking coils 8,6 to keep the optical pickup 41 correctly focused and on track.

10 When the optical pickup 41 is in the park position 48, the control electronic can be used to keep the lens focussed on the focus object, and so avoid rattling of the optical pickup 41. This control can be activated whenever rattles might be expected. For example, if the optical media system 40 is part
15 of a CD played in a motor car (not shown), then the active control of focus in the parking position may be activated as soon as the motor vehicle is energised by the driver.

In use with a CD, the laser power will be typically 1 mW. In
20 order to reduce power consumption, and the heat absorbed by the focus object 50, the laser power at the focus position may be reduced to about 0.1 mW or less, either by pulsing the laser at a 10% duty cycle, or by reducing the laser power, or by a combination of these. Because the focus object is not
25 moving relative to the optical pickup 41, this reduced power should not unduly affect focus operation.

Figures 5 and 6 show another way in which the heat absorbed by the focus object 50 may be reduced. Figure 5 shows a plot
30 of an S-shaped focus error signal 47 against defocus distance. The focus error signal 47 is zero outside $\pm 40 \mu\text{m}$ of best focus. It is possible by introducing an offset into the derived focus error signal to lock onto focus at any point on the curve 47 with a sufficiently high slope, for example at a
35 defocus distance d_0 of $20 \mu\text{m}$. As can be seen in Figure 6, at

this defocus distance, the focus spot S will be about 10 μm , which implies an energy density about 100 fold less than at the best focus at the focus waist W of about 1 μm .

- 5 In addition, the reflector layer 51 is about 250 μm thick in order to increase the ability of the reflector layer 51 to conduct heat away from the focus spot S.

Figure 7 shows a second embodiment of an optical media system 80. This differs from the first embodiment 40 in that there is no focus object, and in that once the optical pickup 41 is in the park position 48, the focus coils 8 are energised to retract fully the lens 2 so that the cradle 4 is held securely against the upper stop 28. This is done with modified control electronics 81 in which a focus offset 82 is added to the focus servo 71. The cradle 4 can then be held against the upper end stop 28 with sufficient force so that expected vibration does not cause rattling of the cradle 4 against the end stops 28,30. An advantage of this embodiment is that there is no need to provide a focus object 50 which, although potentially quite inexpensive, does use a volume within the optical media system and add some small mechanical complexity.

- 25 Figure 8 shows a third embodiment of an optical media system 90. This differs from the first embodiment 40 in that there is no focus object, and from the second embodiment 80 in that the position of the lens 2 and cradle 4 is not controlled so that the cradle is held against one of the end stops 28,30.
- 30 There are two advantages to this approach. The first is that there is no need to provide a focus object 50 and the second is that the focus actuator is not biased fully in one direction, thereby avoiding any induced distortion over time to the wire suspension of the focus and tracking actuator.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference P/5654	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/GB 00/ 02595	International filing date (day/month/year) 05/07/2000	(Earliest) Priority Date (day/month/year) 08/07/1999
Applicant FORD MOTOR COMPANY LIMITED		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.



It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.



the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :



contained in the international application in written form.



filed together with the international application in computer readable form.



furnished subsequently to this Authority in written form.



furnished subsequently to this Authority in computer readable form.



the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.



the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of Invention is lacking** (see Box II).

4. With regard to the **title**,



the text is approved as submitted by the applicant.



the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,



the text is approved as submitted by the applicant.



the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.



as suggested by the applicant.



because the applicant failed to suggest a figure.



because this figure better characterizes the invention.

4



None of the figures.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 00/02595

A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 G11B7/09

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G11B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	PATENT ABSTRACTS OF JAPAN vol. 1999, no. 08, 30 June 1999 (1999-06-30) & JP 11 066574 A (NIPPON CONLUX CO LTD), 9 March 1999 (1999-03-09) abstract ---	1
A	EP 0 550 097 A (PHILIPS NV) 7 July 1993 (1993-07-07) abstract column 3, line 1 - line 18 ---	1
A	US 5 020 045 A (SMART GERALD J ET AL) 28 May 1991 (1991-05-28) abstract --- -/--	1

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

2 October 2000

Date of mailing of the international search report

11/10/2000

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
 NL - 2280 HV Rijswijk
 Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
 Fax: (+31-70) 340-3016

Authorized officer

Quaranta, L

INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 00/02595

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	PATENT ABSTRACTS OF JAPAN vol. 017, no. 605 (P-1639), 8 November 1993 (1993-11-08) & JP 05 182273 A (RICOH CO LTD), 23 July 1993 (1993-07-23) abstract ----	1
A	US 5 590 006 A (SHAFE MATHEW K) 31 December 1996 (1996-12-31) abstract ----	1,2
A	EP 0 558 293 A (CANON KK) 1 September 1993 (1993-09-01) column 5, line 19 -column 7, line 17 ----	1
A	PATENT ABSTRACTS OF JAPAN vol. 1995, no. 08, 29 September 1995 (1995-09-29) & JP 07 129983 A (SHARP CORP), 19 May 1995 (1995-05-19) abstract -----	1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 00/02595

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
JP 11066574	A	09-03-1999	NONE	
EP 0550097	A	07-07-1993	NL 9102190 A JP 5282676 A US 5289440 A	16-07-1993 29-10-1993 22-02-1994
US 5020045	A	28-05-1991	NONE	
JP 05182273	A	23-07-1993	NONE	
US 5590006	A	31-12-1996	CA 2164885 A EP 0799479 A WO 9620475 A HU 77155 A, B JP 2986392 B JP 8255320 A KR 221373 B PL 320689 A US 5701219 A	24-06-1996 08-10-1997 04-07-1996 02-03-1998 06-12-1999 01-10-1996 15-09-1999 27-10-1997 23-12-1997
EP 0558293	A	01-09-1993	JP 5234092 A DE 69321982 D DE 69321982 T US 5475660 A	10-09-1993 17-12-1998 12-05-1999 12-12-1995
JP 07129983	A	19-05-1995	JP 3035136 B	17-04-2000

PATENT COOPERATION TREATY

PCT

REC'D 13 JUL 2001

WIPO

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

3

Applicant's or agent's file reference P/5654	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/GB00/02595	International filing date (day/month/year) 05/07/2000	Priority date (day/month/year) 08/07/1999
International Patent Classification (IPC) or national classification and IPC G11B7/09		
Applicant FORD MOTOR COMPANY LIMITED et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.



2. This REPORT consists of a total of 5 sheets, including this cover sheet.

- ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 2 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 11/01/2001	Date of completion of this report 11.07.2001
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Lehnberg, C Telephone No. +49 89 2399 2590 

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB00/02595

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, pages:

1-9,12,13 as originally filed

10,11 as received on 18/06/2001 with letter of 05/06/2001

Claims, No.:

1-12 as originally filed

Drawings, sheets:

1/2,2/2 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/GB00/02595

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-12
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-12
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-12
	No:	Claims	

2. Citations and explanations
see separate sheet

CONCERNING POINT V:

- 1). Reference is made to the following document:

D1: JP-A-11 066 574

- 2). The present invention relates to an optical media system according to the subject matter of independent claim 1 comprising a pickup for reading and writing from / to an optical medium, an objective lens, a focus and / or tracking actuator, mechanical limits to limit the focus / tracking movement of the lens, and an actuator controller for controlling the actuator and hence the position of the objective lens, the system being characterized in that the actuator controller actively controls the lens position when the optical pickup is not being used with the optical medium.
- 3). The system of the invention is essentially to be used in motor vehicles, and all source of noise is to be avoided. In very quiet cars, rattles were noted in a CD player when the car was driven on a bumpy surface. The source of the noise was traced to the CD pickup hitting the focus (or tracking) end stops when the pickup was in a parked position, owing to vertical vehicle movement and vibrations. The solution of the invention is therefore to actively control the lens position when the pickup is not being used with the optical medium, that is when the pickup is at the park position, and even when no medium is loaded in the device.

D1 cited in the International Search Report discloses a focus and tracking control of the objective lens during a standby when recording and reproducing is not carried out, this control being made on the basis of light beams illuminated from the optical head onto the recording medium. In this document, the light is still radiated onto the recording medium, and the problem to be solved is a problem of heat generation during said standby period. There, the solution is to light the laser source via an intermittently applied voltage to reduce heat propagation; nevertheless, the medium is still used to control focus and tracking.

Therefore, the content of D1 does not disclose nor suggest the subject matter of independent claim 1 as well as that of dependent claims 2 to 12.

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/GB00/02595

Even the other available prior art documents do not disclose nor suggest the subject matter of the present set of claims.

Consequently, the present claims 1 to 12 are considered to meet the novelty and inventive step requirements of Articles 33(2)(3) PCT.

Even if no prior art document is cited in the present application documents, independent claim 1 is delimited in view of a well known optical media system having the basic components.

REPLACED BY
ART 34 AMDT

- 10 -

tracking servo circuit 72. The focus servo circuit generates an appropriate focus correction signal 73, and the tracking servo circuit 72 generates both a coarse tracking correction signal 74 that is fed to the tracking
5 motor 45, and a fine tracking correction signal 75. The focus and tracking correction signals 73,75 are then fed back to the focus and tracking coils 8,6 to keep the optical pickup 41 correctly focused and on track.

10 When the optical pickup 41 is in the park position 48, the control electronic can be used to keep the lens focussed on the focus object, and so avoid rattling of the optical pickup 41. This control can be activated whenever rattles
15 might be expected. For example, if the optical media system 40 is part of a CD played in a motor car (not shown), then the active control of focus in the parking position may be activated as soon as the motor vehicle is energised by the driver.

20 In use with a CD, the laser power will be typically 1 mW. In order to reduce power consumption, and the heat absorbed by the focus object 50, the laser power at the focus position may be reduced to about 0.1 mW or less, either by pulsing the laser at a 10% duty cycle, or by
25 reducing the laser power, or by a combination of these. Because the focus object is not moving relative to the optical pickup 41, this reduced power should not unduly affect focus operation.

30 Figures 5 and 6 show another way in which the heat absorbed by the focus object 50 may be reduced. Figure 5 shows a plot of an S-shaped focus error signal 47 against defocus distance. The focus error signal 47 is zero outside ± 40 nm of best focus. It is possible by
35 introducing an offset into the derived focus error signal to lock onto focus at any point on the curve 47 with a sufficiently high slope, for example at a defocus distance

- 11 -

d_0 of 20 nm. As can be seen in Figure 6, at this defocus distance, the focus spot size S will be about $10\text{ }\mu\text{m}$, which implies an energy density about 100 fold less than at the best focus at the focus waist W of about $1\text{ }\mu\text{m}$.

5

In addition, the reflector layer 51 is about $250\text{ }\mu\text{m}$ thick in order to increase the ability of the reflector layer 51 to conduct heat away from the focus spot S .

10 Figure 7 shows a second embodiment of an optical media system 80. This differs from the first embodiment 40 in that there is no focus object, and in that once the optical pickup 41 is in the park position 48, the focus coils 8 are energised to retract fully the lens 2 so that
15 the cradle 4 is held securely against the upper stop 28. This is done with modified control electronics 81 in which a focus offset 82 is added to the focus servo 71. The cradle 4 can then be held against the upper end stop 28 with sufficient force so that expected vibration does not
20 cause rattling of the cradle 4 against the end stops 28,30. An advantage of this embodiment is that there is no need to provide a focus object 50 which, although potentially quite inexpensive, does use a volume within the optical media system and add some small mechanical
25 complexity.

Figure 8 shows a third embodiment of an optical media system 90. This differs from the first embodiment 40 in that there is no focus object, and from the second
30 embodiment 80 in that the position of the lens 2 and cradle 4 is not controlled so that the cradle is held against one of the end stops 28,30. There are two advantages to this approach. The first is that there is no need to provide a focus object 50 and the second is that
35 the focus actuator is not biased fully in one direction, thereby avoiding any induced distortion over time to the wire suspension of the focus and tracking actuator.

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
18 January 2001 (18.01.2001)

PCT

(10) International Publication Number
WO 01/04884 A1

(51) International Patent Classification⁷: **G11B 7/09**

London N19 4NG (GB). **ROBERTS, Nicholas, James** [GB/GB]; 68 Mariners Way, Maldon, Essex CM9 6YW (GB). **MILES, Dean, Anthony, Edward** [GB/GB]; 23 Churchfields, West Malling, Kent ME19 6RJ (GB).

(21) International Application Number: PCT/GB00/02595

(22) International Filing Date: 5 July 2000 (05.07.2000)

(25) Filing Language: English

(26) Publication Language: English

(74) Agent: **MESSULAM, Alec, Moses**; 43-45 High Road, Bushey Heath, Hertfordshire WD23 1EE (GB).

(30) Priority Data:
9915867.7 8 July 1999 (08.07.1999) GB

(81) Designated States (*national*): JP, US.

(84) Designated States (*regional*): European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).

(71) Applicant (*for all designated States except US*): **FORD MOTOR COMPANY LIMITED** [GB/GB]; Eagle Way, Brentwood, Essex CM13 3BW (GB).

Published:

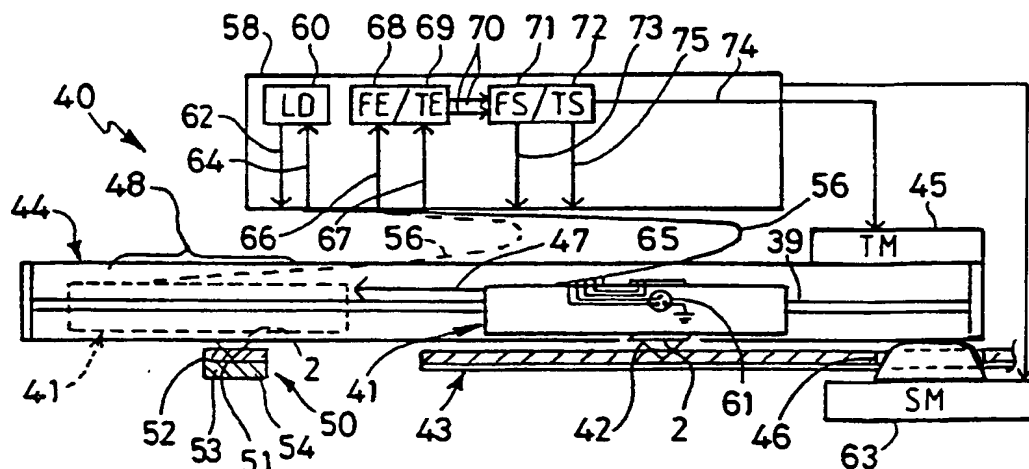
— With international search report.

(72) Inventors; and

(75) Inventors/Applicants (*for US only*): **GALLICHAN, Kevin** [GB/GB]; 3 Hatchard Road, London, Greater

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: OPTICAL MEDIA PICKUP ANTI-RATTLE



(57) Abstract: The present invention relates to an optical media system (40) for suppressing externally induced rattle of an optical media pickup. The system (40) comprises: an optical pickup (41) for reading from and/or writing to an optical storage medium (43), the optical pickup having one or more sources of light (61), an objective lens (2), a focus and/or tracking actuator for moving the lens (2) to focus and/or track the light on the optical medium (43) and mechanical limits to limit the focus and/or tracking movement of the lens (2); and an actuator controller (58) for controlling the actuator and hence the focus and/or tracking position of the lens (2), characterised in that the actuator controller (58) actively controls the lens position when the optical pickup is not being used with the optical medium.